

The invention claimed is:

1. A supported catalyst, comprising:
a solid support; and
a porous coating on the solid support, the porous coating having as a major constituent a material exhibiting catalytic activity, the material exhibiting catalytic activity including a transition-metal containing material, the porous coating having a binder for holding the coating together and adhering the coating to the support.
2. The supported catalyst of claim 1, wherein the transition metal-containing material includes an oxide of a transition metal.
3. The supported catalyst of claim 2, wherein the transition metal is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, yttrium, zirconium, niobium, molybdenum, palladium, silver, tantalum, tungsten, bismuth, antimony, tin, zinc, cerium and lanthanum.
4. The supported catalyst of claim 3, wherein the transition metal is selected from the group consisting of nickel, cobalt, iron, molybdenum, tungsten and chromium.
5. The supported catalyst of claim 1, wherein the solid support is inert or catalytically active.
6. The supported catalyst of claim 5, wherein the support is inert.
7. The supported catalyst of claim 6, wherein the inert solid support is made of a material selected from the group consisting of a metal, glass, ceramic or glass-ceramic material.
8. The supported catalyst of claim 7, wherein the inert solid support is comprised of alumina, titania or silica.

9. The supported catalyst of claim 5, wherein the solid support is in the form of a bead, a pellet, a monolithic honeycomb, or a reticulated foam.
10. The supported catalyst of claim 1, wherein the binder is a condensed silica-containing and/or alumina-containing compound.
11. The supported catalyst of claim 1, wherein the binder includes an alkoxysilane.
12. The supported catalyst of claim 8, wherein the alkoxysilane is tetraethylorthosilane.
13. A bulk transition metal-containing material catalyst, comprising:
a porous solid mass having as a major constituent a transition metal oxide, the solid mass having a binder for holding the catalytically active material together in the solid mass.
14. The bulk catalyst of claim 12, wherein the transition metal oxide is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, yttrium, zirconium, niobium, molybdenum, palladium, silver, lanthanum, tantalum, tungsten, bismuth, antimony, tin, zinc, cerium and lanthanum.
15. The bulk catalyst of claim 12, wherein the transition metal oxide is selected from the group consisting of nickel, cobalt, iron, molybdenum, tungsten and chromium.
16. The bulk catalyst of claim 13, which is in the form of beads, pellets, or a monolithic honeycomb.
17. The bulk catalyst of claim 13, wherein the binder is a condensed silicone-containing and/or alumina-containing compound.
18. The bulk catalyst of claim 13, wherein the binder includes an alkoxysilane.

19. The bulk solid catalyst of claim 18, wherein the alkoxysilane is tetraethylorthosilane.
20. A process for preparing a supported catalyst, comprising:
 - preparing a slurry containing a catalytically active material and a binder, the catalytically active material including a transition-metal containing material and constituting a major portion of the slurry on a dry basis;
 - applying a coating of the slurry onto an inert support; and
 - drying the coating.
21. The process of claim 20, wherein application of the slurry and drying of the applied slurry are repeated to achieve a desired coating thickness on the support.
22. The process of claim 21, further comprising at least one application of a slurry coating containing a catalytically active material including a transition-metal containing materials that is different from the catalytically active material including a transition-metal containing material used in a different coating application.
23. The process of claim 20, wherein the catalytically active material is a transition-metal oxide.
24. The process of claim 23, wherein the transition-metal oxide is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, yttrium, zirconium, niobium, molybdenum, palladium, silver, lanthanum, tantalum, tungsten, bismuth, antimony, tin, zinc, cerium and lanthanum.
25. The process of claim 23, wherein the transition metal oxide is selected from the group consisting of nickel, cobalt, iron, molybdenum, tungsten and chromium.
26. The process of claim 20, wherein the binder is a hydrolyzable and condensable or hydrolyzed and condensable compound.

27. The process of claim 26, wherein the hydrolyzable and condensable or hydrolyzed and condensable compound is a silica-containing and/or alumina-containing compound.
28. The process of claim 20, wherein the binder includes an alkoxysilane.
29. The process of claim 28, wherein the alkoxysilane is tetraethylothsilane.
30. A process for preparing a bulk catalyst, comprising:
preparing a slurry containing a catalytically active material and a binder, the catalytically active material including a transition-metal containing material and constituting a major portion of the total solids in the slurry;
reducing the water content of the slurry as necessary to achieve a paste-like consistency;
forming the slurry into a desired shape; and
drying the shaped material.
31. The process of claim 30, wherein the catalytically active material is a transition-metal oxide.
32. The process of claim 31, wherein the transition-metal oxide is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, yttrium, zirconium, niobium, molybdenum, palladium, silver, lanthanum, tantalum, tungsten, bismuth, antimony, tin, zinc, cerium and lanthanum.
33. The process of claim 31, wherein the transition metal oxide is selected from the group consisting of nickel, cobalt, iron, molybdenum, tungsten and chromium.
34. The process of claim 30, wherein the binder is a hydrolyzable and condensable or hydrolyzed and condensable compound.
35. The process of claim 34, wherein the hydrolyzable and condensable or hydrolyzed and condensable compound is a silica-containing and/or alumina-containing compound.

36. The process of claim 30, wherein the binder includes an alkoxysilane.
37. The process of claim 36, wherein the alkoxysilane is tetraethylthosilane.